

Remarks

Claims 1 through 8, 11 through 16, 18 through 23, 26 through 29, 31 and 32 remain pending and new claim 33 and 34 are presented in the application.

Claims 1 through 11 and 14, 15, 16, 18 through 29, 31 and 32 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Geiger, et al., "INTMDCT - A Link Between Perceptual and Lossless Audio Coding," IEEE Proceedings of ICASSP (2002), in view of Oshikiri, Sound Encoding Apparatus and Sound Encoding Method, U.S. Patent Publication 2005/0252361 (Nov. 17, 2005) and further in view of Li, System and Method for Embedded Audio Coding with Implicit Auditory Masking, U.S. Patent Publication 2003/0187634 (Oct. 2, 2003). The Examiner asserts that it would have been obvious to combine the cited references to yield the inventions claimed in independent claims 1, 15, 16, 18, 28 and 29. However, the combination of Geiger, Oshikiri, and Li does not include all the limitations of the independent claims and thus, these rejections should be withdrawn.

The claim limitation of "wherein at least the following information is determined as the perceptual information of the digital signal by the perceptual model: the bit-plane of the error signal which the bit-plane coding of the error signal starts M(s)" (hereinafter referred to as limitation A) which is defined in previous claim 11 and has now been included into claim 1 has been objected to in view of Geiger (see last paragraph on page 9 of the office action).

However, Geiger is completely silent about this limitation A at all. Indeed, it has been acknowledged that Geiger fails to disclose bitplane coding the error signal based on perceptual information wherein perceptual information of the digital signal is determined using a perceptual model (see the third paragraph on page 4 of the office action). Consequently, Geiger also fails to disclose the bit-plane M(s) of the error signal which the bit-plane coding of the error signal starts is determined as the perceptual information, i.e. limitation A. It is noted the Examiner cites the encoder in FIG. 4 of Geiger against limitation A. However, there is merely a mention in Geiger that the difference to the IntMDCT values is entropy coded, and there is no mention at all that such a difference is bitplane coded. Let alone the limitation that such a difference is bitplane coded based on perceptual information, and the bit-plane of the error signal which the bit-plane coding of the error signal starts M(s) is determined as the perceptual information.

Therefore, Geiger fails to disclose the claim limitation "wherein at least the following information is determined as the perceptual information of the digital signal by the perceptual model: the bit-plane of the error signal which the bit-plane coding of the error signal starts M(s)."

As presented earlier, Oshikiri discloses an acoustic coding apparatus 1300 with a perceptual masking calculation section 1301 and an enhancement layer coder 1302. The perceptual masking calculation section 1301 calculates perceptual masking indicating the magnitude of a spectrum which can not be perceived by the human auditory sense and outputs the perceptual masking to the enhancement layer coder 1302 (paragraphs [120]-[121] and FIG. 15 of Oshikiri). The enhancement layer coder 1302

is mainly constructed of an MDCT section 1501 and an MDCT coefficients quantizer 1502 (paragraph [133] and FIG. 17 of Oshikiri). Further, the MDCT coefficient quantizer 1502 uses the perceptual masking output from the perceptual masking calculation section 1301 for the MDCT coefficients output from the MDCT section 1501 to classify the MDCT coefficients into coefficients to be quantized and coefficients not to be quantized and encodes only the coefficients to be quantized (paragraph [0135] of Oshikiri).

Thus, it can be seen that the perceptual masking output from perceptual masking calculation section 1301 is for quantization purpose, but not for bitplane coding which is not mentioned in Oshikiri at all.

Accordingly, Oshikiri also fails to disclose limitation A.

As above, Li discloses the use of bitplane coding based on auditory masking (paragraph [84] and FIG. 6 of Li).

However, Li merely discloses bitplane coding of the input audio signal. Li fails to disclose an error signal at all and consequently fails to disclose bitplane coding of an error signal.

Accordingly, Li also fails to disclose limitation A.

Limitation A, "wherein at least the following information is determined as the perceptual information of the digital signal by the perceptual model: the bit-plane of the error signal which the bit-plane coding of the error signal starts M(s)" provides the advantage that, in the area of audio, image or video coding and compared with sequential bit-plane coding

procedure which only provides an effort to optimize the MSE performance, perceptual distortion instead of mean square error (MSE) may be minimized which is a more efficient coding method for obtaining optimal perceptual quality in reconstructed audio, image or video signal. In contrast, the sequential bit-plane coding of the error signal scanning with scanning order from most significant bit (MSB) to least significant bit (LSB) is only a sub-optimal option (see, also, the last paragraph on page 29 of the original description).

In addition, when the core coder is a perceptual coder, the noise, i.e., the error signal from the core coder is actually being shaped according to the psychoacoustic model in the core coder. In this case, the spectral shape of the error signal, which is carried in M(s), is good enough to solely determine the perceptual significance of the bit-plane symbols. This technical advantage can also be seen in the last paragraph on page 38 of the original description.

Neither Geiger, Oshikiri, Li or any combination of the references provides any hint or suggestion for a person skilled in the art to arrive at limitation A. Therefore, the subject matter of amended claim 1 which recites limitation A is not obvious in light of Geiger, Oshikiri, Li or any combination thereof. This rejection should be withdrawn.

Similarly, the subject matter of the other amended independent claims 15, 16, 18, 28, and 29 is not obvious in light of Geiger, Oshikiri, Li or any combination thereof.

Similarly, the subject matter of new claim 33 which includes the contents of previous claims 1, 10 and part of the contents of claim 11 (i.e. limitation A), and the subject matter

of new claim 34 which includes the contents of previous claims 18, 25 and part of the contents of claim 26 (i.e. limitation A) are allowable over Geiger, Oshikiri and Li.

Claims 2 through 8, 12, 13, 14, 19 through 23, 25 through 31 and 32 depend from independent claims 1, 15, 16, 18, 28 and 29 respectively and thus, the rejections regarding the dependent claims should also be withdrawn.

Conclusion

This response has addressed all of the Examiner's grounds for rejection. The rejections based on prior art have been traversed. Reconsideration of the rejections and allowance of the claims is requested.

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